Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Cancelled)

2. (Previously Presented) The method of claim 4, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

3. (Cancelled)

4. (Previously Presented) A method comprising:

selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system based on higher-order statistics of a propagation medium; and

selecting a constellation for transmission on the active antennas, where said selecting the constellation for transmission on the active antennas comprises selecting different constellations for two or more of the active antennas.

5. (Previously Presented) The method of claim 4, where the multi-element antenna system comprises a multiple-in multiple-out (MIMO) system.

6. (Previously Presented) The method of claim 4, where said selecting comprises selecting the subset of active antennas based on correlation matrices among the active antennas.

7. (Previously Presented) A method comprising:

selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system based on higher-order statistics of a propagation medium, where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

8. (Previously Presented) The method of claim 4, where said selecting comprises selecting the subset of active antennas based on a fixed data rate.

9. (Currently amended) A method comprising:

selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system based on higher-order statistics of a propagation medium where said selecting comprises determining a subset including M_T active transmit antennas substantially in accordance with the equation

$$(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \frac{\lambda \min(R_T(\tilde{M}_T, \tilde{p}))}{\tilde{M}_T(2^{b_T/\tilde{M}_T} - 1)} \cdot \bar{\lambda}_{\min}(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$$

, where p denotes indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, λ_{min} represents a minimum eigenvalue, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, $\bar{\lambda}_{\min}(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T)$ represents a mean eigenvalue of a square matrix $(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$, $H_w(K_R, \tilde{M}_T)$ represents an K_R X $\tilde{M}_T$ matrix having distributed elements, $H_w^*(K_R, \tilde{M}_T)$ represents a complex conjugate of matrix $H_w(K_R, \tilde{M}_T)$, K_R

represents a number of receive antennas, $(2^{b_T/\tilde{M}_T}-1)$ represents a constellation for the M_T active transmit antennas, and b_T represents a fixed data rate.

10. (Previously Presented) The method of claim 4, further comprising allocating substantially equal power to each of said active antennas.

11. (Currently Amended) A method comprising:

selecting a subset of active antennas from a plurality of available antennas in a multi-element antenna system based on higher-order statistics of a propagation medium where said selecting comprises determining a subset including M_T active transmit antennas substantially in accordance with the equation

$$(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \left\{ \frac{1}{\tilde{M}_T} \left[\ln\det\left(R_T(\tilde{M}_T, \tilde{p})\right) + \sum_{j=1}^{\tilde{M}_T} \sum_{i=1}^{K_R - j} \frac{1}{i} - b_T \ln 2 \right] - \ln \tilde{M}_T \right\},$$ where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, K_R represents a number of receive antennas, and b_T represents a fixed data rate.

12. (Cancelled)

13. (Previously Presented) The apparatus of claim 15, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

14. (Cancelled)

15. (Previously Presented) An apparatus comprising:

a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium, wherein the processor is operative to select a constellation for transmission on the active antennas and to select different constellations for two or more of the active antennas.

16. (Previously Presented) The apparatus of claim 15, where the apparatus comprises at least a portion of a multiple-in multiple-out (MIMO) device.

17. (Previously Presented) The apparatus of claim 15 where the processor is operative to select the subset of active antennas based on correlation matrices among the active antennas.

18. (Previously Presented) An apparatus comprising:

a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium where the processor is operative to select an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

19. (Previously Presented) The apparatus of claim 15, where the processor is operative to select the subset of active antennas based on a fixed data rate.

20. (Currently Amended) An apparatus comprising:

a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium where the processor is operative to select a subset including M_T active transmit antennas substantially in accordance with the equation $(\tilde{M}_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \frac{\lambda \min(\mathrm{R}_T(\tilde{M}_T, \tilde{p}))}{\tilde{M}_T(2^{b_T/\tilde{M}_T} - 1)} \cdot \bar{\lambda}_{\min}(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$, where

p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, λ_{min} represents a minimum eigenvalue, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, $\bar{\lambda}_{min}(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$ represents a mean eigenvalue of a square matrix $(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$, $H_w(K_R, \tilde{M}_T)$ represents an K_R X $\tilde{M}_T$ matrix having distributed elements, $H_w^*(K_R, \tilde{M}_T)$ represents a complex conjugate of matrix $H_w(K_R, \tilde{M}_T)$, K_R represents a number of receive antennas, $(2^{b_T/\tilde{M}_T} - 1)$ represents a constellation for the M_T active transmit antennas, and b_T represents a fixed data rate.

21. (Previously Presented) The apparatus of claim 15 where the processor is operative to allocate substantially equal power to each of said active antennas.

22. (Currently Amended) An apparatus comprising:

a processor operative to select a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium where the processor is operative to select a subset including M_T active transmit antennas substantially in accordance with the equation $(\tilde{M}_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \left\{ \frac{1}{\tilde{M}_T} \left[\ln\det\left(R_T(\tilde{M}_T, \tilde{p})\right) + \sum_{j=1}^{\tilde{M}_T} \sum_{i=1}^{K_R - j} \frac{1}{i} - b_T \ln 2 \right] - \ln \tilde{M}_T \right\}$,

where p denotes indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p

indices, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, K_R represents a number of receive antennas, and b_T represents a fixed data rate.

23. (Cancelled)

24. (Previously Presented) The apparatus of claim 26, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

25. (Cancelled)

26. (Previously Presented) An apparatus comprising:

a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium and means for selecting a constellation for transmission on the active antennas including means for selecting different constellations for two or more of the active antennas.

27. (Previously Presented) The apparatus of claim 26, where the apparatus comprises at least a portion of a multiple-in multiple-out (MIMO) device.

28. (Previously Presented) The apparatus of claim 26 further comprising means for selecting the subset of active antennas based on correlation matrices among the active antennas.

29. (Previously Presented) An apparatus comprising:

a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium, where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

30. (Previously Presented) The apparatus of claim 26, further comprising means for selecting the subset of active antennas based on a fixed data rate.

31. (Currently Amended) An apparatus comprising:

a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium and means for determining a subset including M_T active transmit antennas substantially in accordance with the equation $(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \frac{\lambda \min(R_T(\tilde{M}_T, \tilde{p}))}{\tilde{M}_T(2^{b_T/\tilde{M}_T} - 1)} \cdot \bar{\lambda}_{\min}(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$, where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, λ_{min} represents a minimum eigenvalue, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, $\bar{\lambda}_{\min}(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$ represents a mean eigenvalue of a square matrix $(H_w^*(K_R, \tilde{M}_T)H_w(K_R, \tilde{M}_T))$, $H_w(K_R, \tilde{M}_T)$ represents an K_R X $\tilde{M}_T$ matrix having distributed elements, $H_w^*(K_R, \tilde{M}_T)$ represents a complex conjugate of matrix $H_w(K_R, \tilde{M}_T)$, K_R represents a number of receive antennas, $(2^{b_T/\tilde{M}_T} - 1)$ represents a constellation for the M_T active transmit antennas, and b_T represents a fixed data rate.

32. (Previously Presented) The apparatus of claim 26, further comprising means for allocating substantially equal power to each of said active antennas.

33. (Currently Amended) An apparatus comprising:

a processor including means for selecting a subset of active antennas from a plurality of available antennas based on higher-order statistics of a propagation medium and means for determining a subset including M_T active transmit antennas substantially in accordance with the equation $(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \left\{ \frac{1}{\tilde{M}_T} \left[\ln\det\left(R_T(\tilde{M}_T, \tilde{p})\right) + \sum_{j=1}^{\tilde{M}_T} \sum_{i=1}^{K_R - j} \frac{1}{i} - b_T \ln 2 \right] - \ln \tilde{M}_T \right\}$, where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, K_R denote a number of receive antennas, and b_T represents a fixed data rate.

34. (Cancelled)

35. (Currently Amended) The ~~method~~ system of claim 37, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

36. (Cancelled)

37. (Previously Presented) A system comprising:

a propagation medium;

a first transceiver including a plurality of available antennas;

a second transceiver including

a plurality of available antennas

a processor operative to determine higher-order statistics of the propagation medium from signals received from the plurality of available antennas at the first transceiver; and

an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of the propagation medium, where the processor is operative to select a constellation for transmission on the active antennas and select different constellations for two or more of the active antennas.

38. (Previously Presented) The system of claim 37, where the system comprises at least a portion of a multiple-in multiple-out (MIMO) device.

39. (Previously Presented) The system of claim 37 where the processor is operative to select the subset of active antennas based on correlation matrices among the active antennas.

40. (Previously Presented) A system comprising:

a propagation medium;

a first transceiver including a plurality of available antennas;

a second transceiver including

a plurality of available antennas

a processor operative to determine higher-order statistics of the propagation medium from signals received from the plurality of available antennas at the first transceiver; and

an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of the propagation medium,

where the processor is operative to select an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

41. (Previously Presented) The system of claim 37 where the processor is operative to select the subset of active antennas based on a fixed data rate.

42. (Currently Amended) A system comprising:

a propagation medium;

a first transceiver including a plurality of available antennas;

a second transceiver including

a plurality of available antennas

a processor operative to determine higher-order statistics of the propagation medium from signals received from the plurality of available antennas at the first transceiver; and

an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of a propagation medium,

where the processor is operative to select a subset including M_T active transmit antennas substantially in accordance with the equation

$$(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \frac{\lambda \min(\mathrm{R}_T(\tilde{M}_T, \tilde{p}))}{\tilde{M}_T(2^{b_T/\tilde{M}_T} - 1)} \cdot \bar{\lambda}_{\min}(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$$, where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, λ_{min} represents a minimum eigenvalue, $\mathrm{R}_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, $\bar{\lambda}_{\min}(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$ represents a mean eigenvalue of a square matrix $(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$, $\mathrm{H}_w(K_R, \tilde{M}_T)$ represents an K_R X $\tilde{M}_T$ matrix having distributed elements, $\mathrm{H}_w^*(K_R, \tilde{M}_T)$ represents a complex conjugate of matrix $\mathrm{H}_w(K_R, \tilde{M}_T)$, K_R

represents a number of receive antennas, $(2^{b_T/\tilde{M}_T}-1)$ represents a constellation for the M_T active transmit antennas, and b_T represents a fixed data rate.

43. (Previously Presented) The system of claim 37 where the processor is operative to allocate substantially equal power to each of said active antennas.

44. (Currently Amended) A system comprising:

a propagation medium;

a first transceiver including a plurality of available antennas;

a second transceiver including a plurality of available antennas;

a processor operative to determine higher-order statistics of the propagation medium from signals received from the plurality of available antennas at the first transceiver; and

an antenna selection module operative to select a subset of active antennas from the plurality of available antennas based on higher-order statistics of the propagation medium,

where the processor is operative to select a subset including M_T active transmit antennas substantially in accordance with the equation

$$\left(M_T, p\right) = \arg\max_{(\tilde{M}_T, \tilde{p})} \left\{ \frac{1}{\tilde{M}_T} \left[\ln\det\left(R_T(\tilde{M}_T, \tilde{p})\right) + \sum_{j=1}^{\tilde{M}_T} \sum_{i=1}^{K_R-j} \frac{1}{i} - b_T \ln 2 \right] - \ln \tilde{M}_T \right\},$$

where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, K_R represents a number of receive antennas, and b_T represents a fixed data rate.

45. (Cancelled)

46. (Previously Presented) The computer program of claim 48, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

47. (Cancelled)

48. (Previously Presented) A computer program comprising the steps of:

selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium; and

selecting a constellation for transmission on the active antennas including selecting different constellations for two or more of the active antennas.

49. (Previously Presented) The computer program of claim 48 where the multi-element antenna system comprises a multiple-in multiple-out (MIMO) system.

50. (Previously Presented) The computer program of claim 48 where said selecting comprises selecting the subset of active antennas based on correlation matrices among the active antennas.

51. (Previously Presented) A computer program comprising the steps of:

selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium where said selecting comprises selecting an optimum number of antennas to maximize a minimum signal-to-noise ratio (SNR) margin.

52. (Previously Presented) The computer program of claim 48 where said selecting comprises selecting the subset of active antennas based on a fixed data rate.

53. (Currently Amended) A computer program comprising the steps of:

selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium, wherein said selecting comprises determining a subset including M_T active transmit antennas substantially in accordance with the equation

$$(M_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \frac{\lambda \min(\mathrm{R}_T(\tilde{M}_T, \tilde{p}))}{\tilde{M}_T(2^{b_T/\tilde{M}_T} - 1)} \cdot \bar{\lambda}_{\min}(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$$, where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, λ_{min} represents a minimum eigenvalue, $\mathrm{R}_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, $\bar{\lambda}_{\min}(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$ represents a mean eigenvalue of a square matrix $(\mathrm{H}_w^*(K_R, \tilde{M}_T)\mathrm{H}_w(K_R, \tilde{M}_T))$, $\mathrm{H}_w(K_R, \tilde{M}_T)$ represents an K_R X $\tilde{M}_T$ matrix having distributed elements, $\mathrm{H}_w^*(K_R, \tilde{M}_T)$ represents a complex conjugate of matrix $\mathrm{H}_w(K_R, \tilde{M}_T)$, K_R represents a number of receive antennas, $(2^{b_T/\tilde{M}_T} - 1)$ represents a constellation for the M_T active transmit antennas, and b_T represents a fixed data rate.

54. (Previously Presented) The computer program of claim 48 further comprising generating a signal operative to allocate substantially equal power to each of said active antennas.

55. (Currently Amended) A computer program comprising the steps of:

selecting a subset of active antennas from a plurality of available antennas in an multi-element antenna system based on higher-order statistics of a propagation medium, wherein said selecting comprises determining a subset including M_T active transmit antennas [by solving for] substantially in accordance with the equation

$$(\tilde{M}_T, p) = \arg\max_{(\tilde{M}_T, \tilde{p})} \left\{ \frac{1}{\tilde{M}_T} \left[\ln\det\left(R_T(\tilde{M}_T, \tilde{p})\right) + \sum_{j=1}^{\tilde{M}_T} \sum_{i=1}^{K_R - j} \frac{1}{i} - b_T \ln 2 \right] - \ln \tilde{M}_T \right\}$$

, where p represents indices of the M_T active transmit antennas, $\tilde{M}_T$ represents a dummy variable for optimizing the M_T active transmit antennas, $\tilde{p}$ represents a dummy variable for optimizing the p indices, $R_T(\tilde{M}_T, \tilde{p})$ represents a correlation matrix among the M_T active transmit antennas, K_R represents a number of receive antennas, and b_T represents a fixed data rate.

56. (Cancelled)

57. (Currently Amended) The ~~method~~ system of claim 40, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

58. (Currently Amended) The ~~method~~ system of claim 42, wherein the higher-order statistics comprise second-order statistics of the propagation medium.

59. (Currently Amended) The ~~method~~ system of claim 44, wherein the higher-order statistics comprise second-order statistics of the propagation medium.